

The Surgeon Cardiologists of the 19th Century

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In the days of Greece and Alexandria, medicine was one and undivided and the surgery of Hippocrates has been regarded as even more admirable than his medicine. In the golden days of Greek surgery Archigenes, a pioneer in amputations, was also the foremost authority on the pulse prior to Galen, and it was not until the 11th century that Albucasis of Cordova wrote the first separate and independent work on surgery in Arabic, which Withington regarded as marking an epoch in medical history. Allbutt (1905) in his scholarly review of the historical relations of medicine and surgery relates how in the 13th–15th centuries surgeons were not only illiterate but forbidden the means of learning, yet by practical experience they advanced their craft. He regarded the foundation of the Royal College of Surgeons in 1798 as the final step in the separation of surgery from medicine in this country (Royal Charter granted in 1800). By the end of the 19th century the division had reached the stage when an eminent surgeon declared that the cæcum belonged to the physician and the appendix to the surgeon, and when few Fellows of the College of Physicians would condescend to make a digital examination of the rectum.

However, in the early part of the 19th century, the distinction was not so sharp in practice, especially in the provinces, where many prominent surgeons were still engaged in general practice including midwifery, and some were also most competent physicians. At this period, aneurysm was a common condition of much concern to surgeons who thus became interested in cardiovascular disease. The first textbook on heart disease in English was written by a surgeon, Allan Burns of Glasgow (1809), and the next most important work on cardiovascular disease was written by Joseph Hodgson of Birmingham (1815), later President of the Royal College of

Surgeons. Wardrop and Bellingham, both authorities on aneurysm, also wrote important textbooks on heart disease, and Robert Adams, thrice President of the Royal College of Surgeons of Ireland, made many important contributions to cardiology including the first authentic description of Adams-Stokes syndrome. Today, when the British Cardiac Society includes many surgeons, some account of their predecessors of a century or more ago may be of interest.

ALLAN BURNS (1781–1813)

Burns, lecturer on surgery and anatomy at Glasgow, worked in his brother's dissecting room where he became especially interested in vascular disease and aneurysm. In 1804, he was invited to St. Petersburg by the Empress Catherine, to act as surgeon to a hospital there, but after six months in Russia he returned to Glasgow to take over the lectures of his brother, later Professor of Surgery, who had become involved in body-snatching inquiries. Not having a University degree, he was unable to practise in Glasgow, but visited his brother's patients, and obtained the clinical histories of the cases he dissected at necropsy from colleagues in practice.

His *Observations on Some of the Most Frequent and Important Diseases of the Heart*, published in 1809 when he was 28, soon took its place alongside the textbooks of Corvisart, Kreysig, and Testa, as one of the authoritative works on heart disease prior to the discovery of auscultation. The title page of this book is shown. A German edition appeared in 1813 and an Italian edition, of which I possess a copy, in 1816. His *Observations on the Surgical Anatomy of the Head and Neck* (1811) went through three English editions, and American and German editions.

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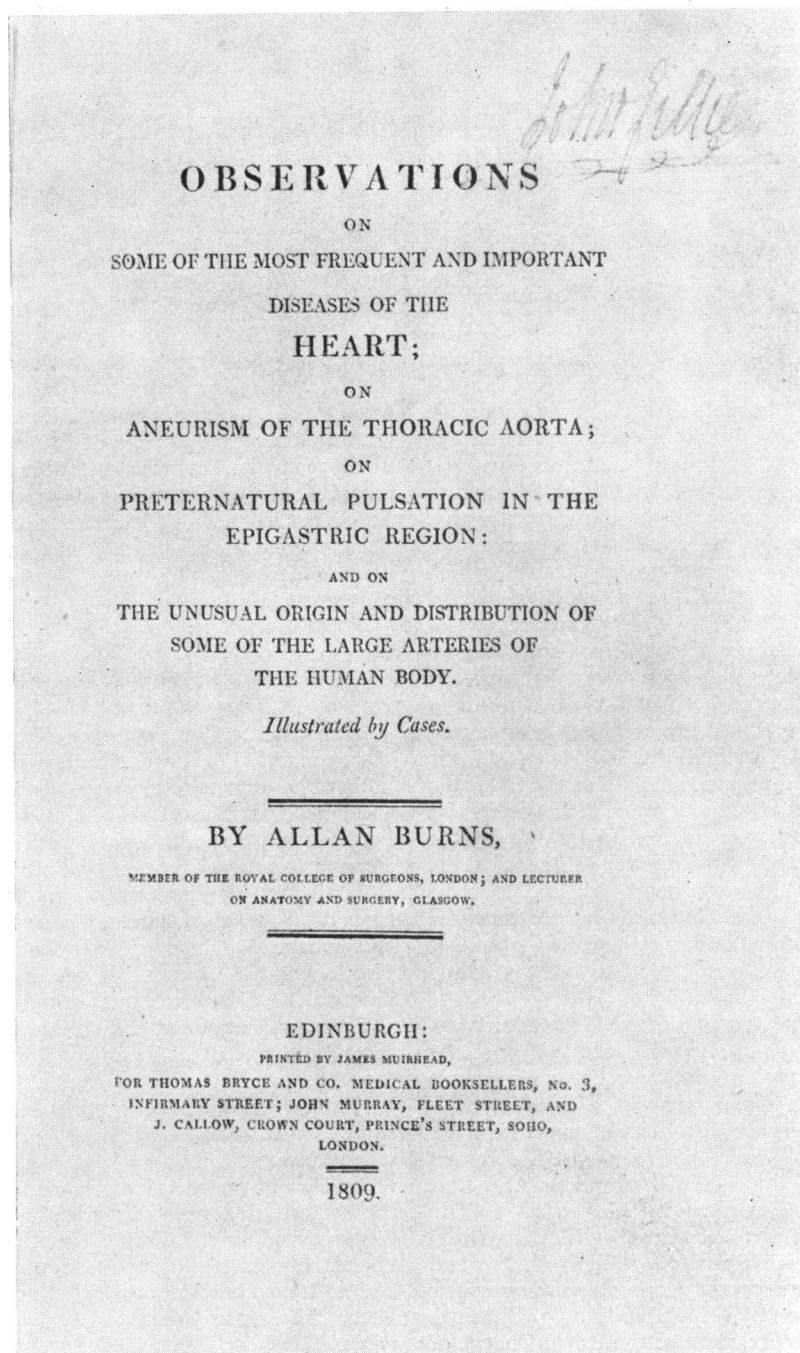


FIG. 1.—Title page of Allan Burns' Treatise, 1809. (Author's library.)

His treatise on heart disease is scarcely a textbook in the modern sense but rather an attempt to correlate post-mortem findings with the symptoms and clinical course on the lines of Morgagni. Perhaps the most remarkable section is that entitled *On Disease of the Coronary Arteries and Syncope Anginosa*. He stated that angina had become quite frequent, and that Parry had incontrovertibly proved it to originate from organic lesions of the nutrient vessels of the heart. He likened the heart with ossified coronaries to a limb begirt with a ligature which, when exercised, sinks into a state of quiescence, and this experiment was repeated by Lewis in 1932. Influenced no doubt by Parry's term *Syncope Anginosa*, he did not mention pain in the limb, though he was quite familiar with angina of effort. When syncopal symptoms accompanied severe anginal fits, he advocated inflating the lungs and passing electric shocks through the chest, thus anticipating the modern treatment of cardiac arrest.

The section on aneurysm also deserves mention as Burns had dissected 14 cases of aortic aneurysm and gave an excellent account of the symptoms. While praising Scarpa's work on aneurysm, he disagreed with his view that it always resulted from a localized rupture of the inner coat and described diffuse cylindrical dilatation of the aorta with intact coats, a condition later described by Hodgson. His ideas on the physiology of the circulation were at variance with Harvey's, as he thought that the circulation depended as much on the arteries as on the heart which normally had only a reservoir function. Only when the arteries were diseased did the circulation depend on the heart, and somewhat similar ideas were later expressed by Wardrop.

In the section on congenital malformations he described patent foramen ovale and opposed the prevalent view of some authorities that subjects with this lesion made good divers. This was based on the idea that because the foetus survived in amniotic fluid with a patent foramen ovale, those with an atrial septal defect were able to resist the watery element much longer than others.

Burns began to suffer from dyspepsia in 1810, and was handicapped by increasing ill health up to the time of his death at the age of 31, from an abdominal abscess, probably originating in the appendix, which ruptured into the rectum.

Burns was the first to give a clear account of the ischaemic theory of anginal pain and to link it exclusively with coronary disease, whereas in contemporary and later textbooks the whole subject became confused and controversial, and it was not until Herrick identified the syndrome of coronary thrombosis, over a century later, that Burns' and Parry's views were finally confirmed and accepted.

JOSEPH HODGSON (1788-1869)

Son of a Birmingham merchant, Joseph Hodgson was apprenticed to Dr. Freer, surgeon to the General Hospital and author of a treatise on aneurysm for which Hodgson drew some of the plates. He was present as a dresser in 1806 when Freer successfully tied the external iliac artery for femoral aneurysm for

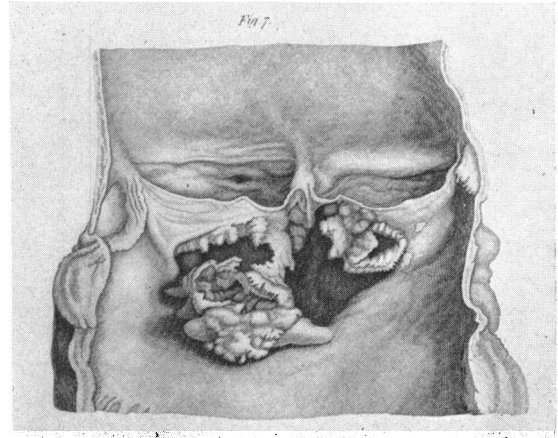


FIG. 2.—From Hodgson's *Engravings of Diseased Arteries*, 1815, showing bacterial endocarditis of aortic valve with perforated cusps and ulceration of ventricular wall, drawn by Hodgson; reputed to be the first published illustration of this condition. (Author's library.)

the first time, and made the drawing of this case published in Freer's book. He then studied in London, taking the M.R.C.S. in 1811, and was awarded the Jacksonian Prize for his essay on Wounds and Diseases of Arteries and Veins which was later expanded into his famous *Treatise on the Diseases of Arteries and Veins* (1815), published when he was 27, and later accompanied by a separate atlas of engraved plates, many from his own drawings. This book quickly gained him an international reputation and German (1817) and French (1819) editions followed, both of which became easier to obtain than the English edition, now very rare. I am fortunate in possessing all three editions and the atlas which is noteworthy for its fine engravings, including a magnificent illustration of infective endocarditis of the aortic valves with ruptured cusps (see illustration). He also described cylindrical dilatation of the aorta with relative aortic incompetence (*Maladie de Hodgson*) already identified by Burns. He was familiar with coronary disease and signed the post-mortem report on Arnold of Rugby who died in his first attack of angina and had only a single coronary artery; the post-mortem report was later published by Latham (1846). He also helped Farre in his treatise on *Congenital Heart*

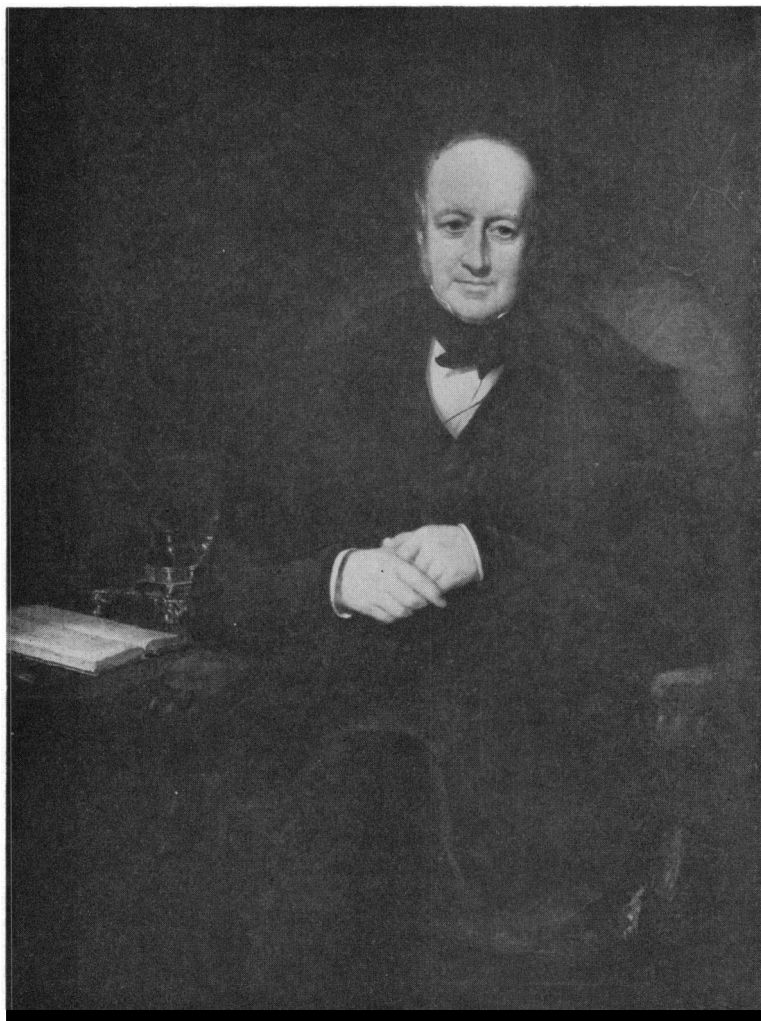


FIG. 3.—Joseph Hodgson, F.R.S. Portrait by John Partridge, R.A., in Queen Elizabeth Hospital, Birmingham. (Photograph by courtesy of Dr. T. L. Hardy.)

Disease (1814) which portrayed Fallot's tetralogy long before Peacock's more famous book. He became the leading surgeon in the Midlands, was a dexterous ophthalmic surgeon, and gained a great reputation in cutting for stone. He was present on July 19, 1843, at the Worcester Royal Infirmary when the B.M.A. was founded. In 1840, he declined invitations to become surgeon to the Middlesex and Professor at King's College, but he did move to London in 1849, at the age of 61, with ample means to retire, but was elected to the Council of the Royal College of Surgeons and became its first provincial president in 1862. He had been elected F.R.S. in 1837.

Hodgson lost the sight of one eye in 1841 and in

1868 developed heart-block with a pulse of 40. He died at the age of 81.

His portrait painted by John Partridge is shown at Fig. 3.

ROBERT ADAMS (1791–1875)

Adams was surgeon to the Jervis Street Infirmary in Dublin and three times President of the Royal College of Surgeons of Ireland. He made many important contributions to surgery, especially of the joints, and his fame in cardiology rests on a paper of a hundred pages in the *Dublin Hospital Reports* (1827) entitled *Cases of Diseases of the Heart*, accompanied with *Pathological Observations*. This



FIG. 4.—Robert Adams. From Herrick, J. B. *A short History of Cardiology*, 1942. (Courtesy of Charles C. Thomas, publisher, Springfield, Illinois.)

paper includes the first description of Adams-Stokes syndrome in a man aged 68, who had a series of apoplectiform seizures over a period of seven years and a remarkable slowness of the pulse, around 30 a minute; it became even slower during the attacks in one of which he died. At necropsy there was a dilated right heart, a soft, thin-walled left ventricle with fatty changes, and bony spicules in the aortic valves. Stokes' later and more comprehensive account (1846) was based on seven cases including Adams' case and two of his own.

Adams' paper includes an excellent account of mitral stenosis in which he noted the arrhythmia, the pulse deficit, and jugular distension, and also cases of ruptured heart and ossific disease of the aortic valve with coronary disease. He suggested that the cardiac enlargement in adhesive pericarditis was due to the increased blood-flow via the pericardial anastomoses, an idea which later influenced surgeons to provoke pericardial adhesions in the treatment of coronary disease.

Adams was evidently a successful surgeon who engaged in general practice and a sound all-round physician who, as Herrick (1939) remarks, deserves most honourable mention in any history of cardiology. In his classical paper of 1827, he was entitled *Mr. Adams*, indicating that he was predominantly a surgeon. See Fig. 4.

JAMES WARDROP (1782–1869)

Wardrop (Fig. 5), surgeon to King George IV, had a fascinating career. Born in Linlithgowshire, near the Hunters' home, he started his medical studies in Edinburgh, continued them in London, and then, in spite of the state of war with France, he proceeded to Paris and thence to Vienna. He returned to Edinburgh at the age of 22, and practised there for some years. He moved to London in 1809, having already established a reputation in ophthalmic and general surgery. His appointment to the Court arose in a curious way. A favourite mare of the Prince Regent developed a violent attack of ophthalmia and Lord Queensbury was commanded to summon the first surgeon oculist in London. Wardrop, "a skilful oculist and well versed in the mysteries of the stable", was called in and his treatment was so successful that he was appointed personal surgeon to the Prince Regent, later George IV, who offered him a baronetcy which was declined. Wardrop's essays on the morbid anatomy of the eye were published in two volumes and he also wrote an essay on diseases of the eye of the horse for the Ministry of Agriculture. Having no hospital appointment, he established his own hospital for surgery in London, which became a popular post-graduate centre. Later he lectured on surgery at the Hunterian school in Great Windmill Street. He was undoubtedly a skilful general and ophthalmic surgeon and a recognized authority on aneurysm which he treated by distal ligation (Wardrop, 1828), and was reputed to have been the first surgeon to ligate the carotid successfully for aneurysm.

The first part of his *Treatise on Heart Disease* (1837) dealt with the pathological physiology of the circulation and was evidently regarded as important, for French and German editions were published. The full treatise appeared in 1851 and a second edition was published in Edinburgh in 1859. Though I have possessed a copy of the 1851 edition for many years, it proved tedious reading and it needed O'Farrell's (1956) paper on Wardrop to encourage me to wade through it.

The first part describing the musculo-cardiac, the pulmo-cardiac, and veno-pulmonary functions deals with the peripheral circulation, the reservoir function of the lungs and of the systemic veins. He

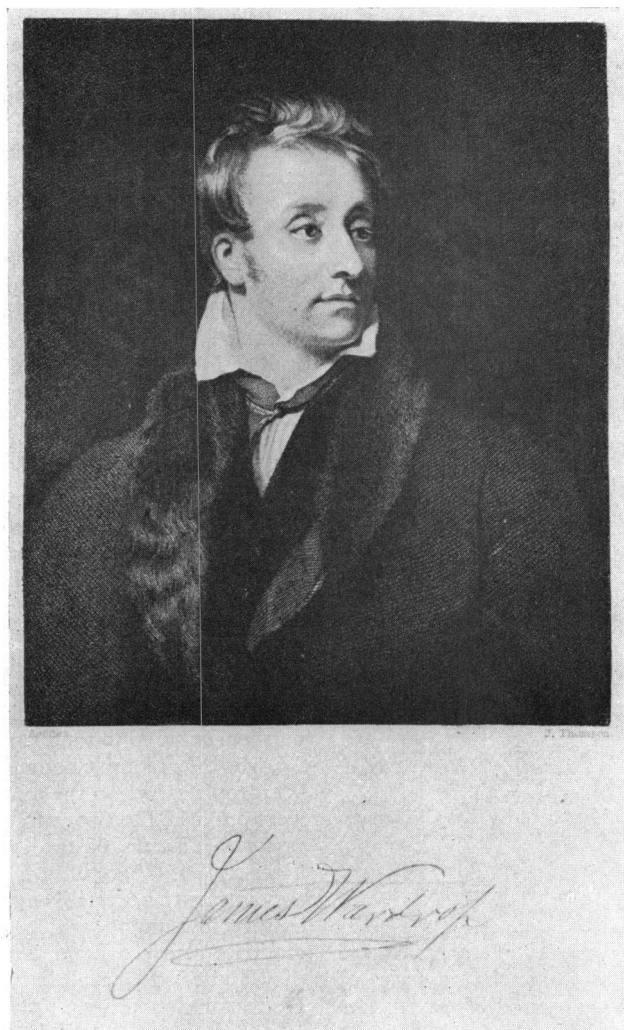


FIG. 5.—James Wardrop, Surgeon to H.M. King George IV. (From Pettigrew, *Medical Portrait Gallery*, 1838, Vol. 2.)

thought that muscular activity increased the venous return and by compressing the arteries impeded the output of the left ventricle, so increasing the contents of the heart and promoting a more vigorous systole, a sort of reversed Starling's Law. Like Burns, he imagined that the arteries and veins had a circulatory function independent of the heart which was little more than a reservoir in active animals. His very prolific account of the backpressure theory was much inferior to Forget's published in the same year.

Wardrop was no believer in the stethoscope, but relied on the history and symptoms in prognosis and treatment and in this respect, like Mackenzie, he sought to wipe the slate clean and develop a

purely functionary outlook on heart disease. He regarded angina as a nervous symptom common to many forms of heart disease in which the cardiac nerves were involved. The only connexion with coronary disease which he admitted was pressure on the nerves by ossified coronary arteries. He regarded gouty or arthritic pericarditis as separate from rheumatic, and thought that gout was translated from the joints to the heart when the joint inflammation subsided. Called in to the king during his last illness when he was being treated for inflammation of the lungs, Wardrop diagnosed heart disease of gouty origin. This upset Sir Henry Hallford and Sir William Knighton, but the necropsy amply confirmed Wardrop's diagnosis, disclosing

aortic stenosis and atheroma, a large heart, and bilateral hydrothorax. As a result of this, Wardrop was not called to Windsor again, though it is stated that the king repeatedly asked for him. A full account of the king's illness is given by Pettigrew (1838) who states that Sir William Knighton sent a message to Wardrop from his death-bed regretting his behaviour. Sir Henry Halford, who had been criticized in the press for his misleading bulletins, gave his own version of the king's illness in an evening address at the College of Physicians in 1831, without mentioning Wardrop's name, but stating that he had informed the government and the Royal family on April 27 that the king's illness was due to heart disease, but this was two days after Wardrop's last visit.

Wardrop's treatment of cardiac syncope is interesting as he advocated mouth-to-mouth breathing with the nostrils closed followed by artificial respiration with bellows via the nostrils.

While there is much of interest and originality in Wardrop's treatise, it is tedious reading and I must endorse O'Farrell's verdict that it contained so much that was irrelevant and at times inaccurate that it is difficult to separate the chaff from the grain.

Wardrop was obviously a surgeon of great ability and an opportunist who achieved success in practice by his own efforts. He was not always popular with his colleagues and is described as having a blunt address and somewhat eccentric humour, a bluff freedom of speech, and a disposition to call things by their right name which served much to his disadvantage. He died in London at the age of 87.

O'BRYEN BELLINGHAM (1805-1857)

Son of Sir Alan Bellingham of Castlebellingham, O'Bryen Bellingham was surgeon to St. Vincent's Hospital, Dublin. After qualifying in 1828, he studied in Edinburgh for two years, obtaining the degree of M.D. He was a versatile man with wide interests, having been Professor of Botany, Examiner in Pharmacy and Surgery, Honorary Librarian at the College of Surgeons, Secretary of the Surgical Society, and a keen naturalist and authority on entozoa. Like Hodgson and Wardrop, he was a good ophthalmic and general surgeon and an authority on aneurysm. His *Observations on Aneurism and its Treatment by Compression* (1847) gained him an international reputation. He treated peripheral aneurysm by continuous compression proximal to the sac maintained by relays of students. According to Mulcahy (1957) he performed Symes' amputation for the first time in Dublin, using ether anaesthesia in 1847, shortly after its discovery by Morton in 1846.

His interest in cardiology was longstanding for he published a chart of auscultatory signs, which was translated into German, and his *Treatise on Diseases of the Heart* (1857), published shortly after his death, was based on lectures at St. Vincent's Hospital. This treatise was highly regarded in its time and Austin Flint cited it repeatedly in his textbook, but it was somewhat overshadowed historically by the work of his better known Dublin contemporaries, Stokes, Adams, Graves, and Corrigan. Bellingham's book is good reading compared with Wardrop's tedious work, and presented a scholarly and comprehensive account of current cardiology in the early days of auscultation and percussion, when knowledge of the physical signs of heart disease had only just been founded by the work of Corvisart, Bouillaud, Forget, Hope, and Williams, amongst others. It seems astonishing that a busy surgeon should have acquired such a vast knowledge of the literature of heart disease, but probably his post as librarian gave him ready access to current books and journals. His treatise consists of two parts, the first dealing with the healthy heart and the physical signs of heart disease, and the second with individual diseases of the heart such as pericarditis, endocarditis, myocardial disease, and functional affections. In his account of congestive heart failure he cited Wardrop's views at length. His description of pericarditis, comprising 81 pages, is of historical interest, especially the account of paracentesis which had not then been performed in Dublin. He favoured incision rather than aspiration by trocar. Like Wardrop, he regarded angina as a symptom of many forms of heart disease, remarking that earlier writers had supposed some mysterious connexion with ossification of the coronary arteries. Nevertheless, he admitted that overdistension of the heart might impede the coronary circulation by compressing the coronary vessels between atria and ventricles, and that distension of the right atrium impeded the coronary venous return. He stated that what dyspnoea is to the lungs, angina is to the heart. Reading his treatise today, it compares favourably with that of Stokes and is vastly better than Wardrop's.

The careers of these five men had much in common. Except for Burns, all were busy general surgeons engaged in teaching and in practice, yet they found time to keep careful records of their medical cases and to check their clinical signs by necropsy whenever possible. Their versatility was remarkable. Three of them were skilled ophthalmic surgeons and four were recognized international authorities on aneurysm and its treatment, while

Burns' reputation as an anatomist became world-wide. All of them were endowed with the spirit of investigation and research and must have had a tremendous capacity for hard work. Several achieved fame at an early age; Burns was 28 when his magnum opus was published, Hodgson was 27, and Wardrop's work on the morbid anatomy of the eye first appeared when he was 26, though his book on heart disease was not written until he was 55. In this regard, we may recall that Stokes wrote the first book in English on the use of the stethoscope while still a student at Edinburgh, and Hope was only 30 when the first edition of his epoch-making textbook was published in 1831.

Allbutt always regarded the separation of Medicine into two professions as unnatural, and he held that a doctor's activities should be directed by personal choice rather than by the survival of medieval rules. Had he lived today, he would surely have been gratified to find that, at least in cardiology, physicians are no longer brought up in unhandy ways and that the field of medicine is no longer forbidden to the surgeon. Indeed history has endorsed the concluding words of his address at St. Louis in 1904—"by the mouths of barbers and cutters rather than of the pharisees of the colleges, Medicine has breathed her lowly message to her children".

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